



Effectiveness of Wildlife Exits in Reducing Road Mortalities Along a South Texas Highway

Zarina Sheikh¹, Kevin Ryer¹, John Young², Richard Kline¹

University of Texas Rio Grande Valley | School of Earth, Environmental, and Marine Sciences



Introduction

- Wildlife road mortalities pose a serious threat to animal populations, including the endangered ocelot.¹
- In Cameron County, Texas, barrier fencing and other mitigation structures are being used to reduce these wildlife mortalities along State Highway (SH) 100.²
- Due to concerns regarding animals being trapped on the outside of the fencing, the Texas Department of Transportation added ten wildlife exits in February 2019 along an 11.9 km stretch of SH 100 between Los Fresnos, TX and Laguna Vista, TX.
- These exits give animals an option to exit the right-of-way.
- Previous research has shown that wildlife usage of jump-outs has been low.³
- As this is the first use of wildlife exits on a mitigation project in Texas, it is important to monitor their effectiveness.

Study Area

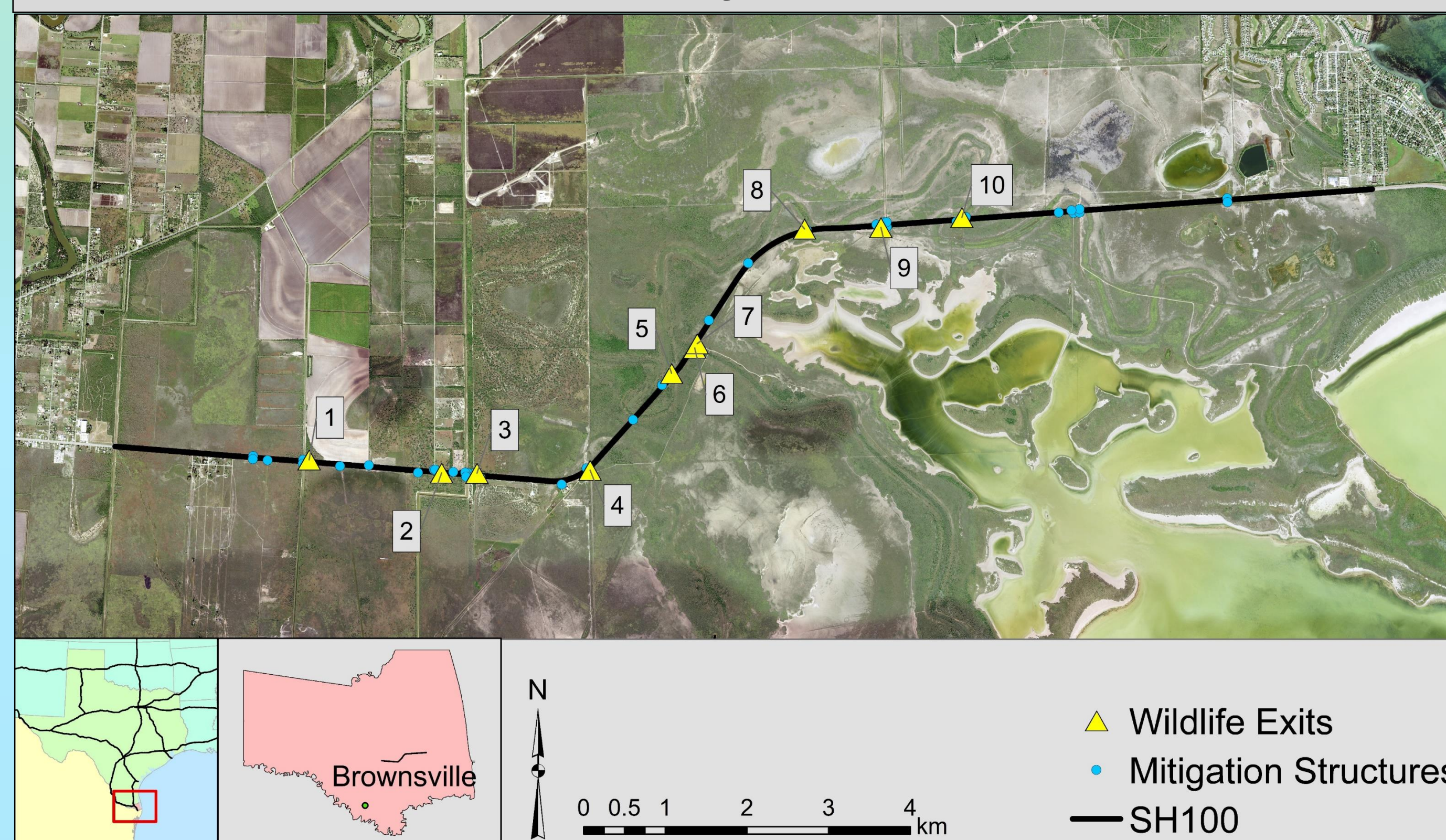


Figure 1. All ten wildlife exits along SH 100, as well as mitigation structures including crossings, gates, guards, wingwalls, and fence ends.

Objectives

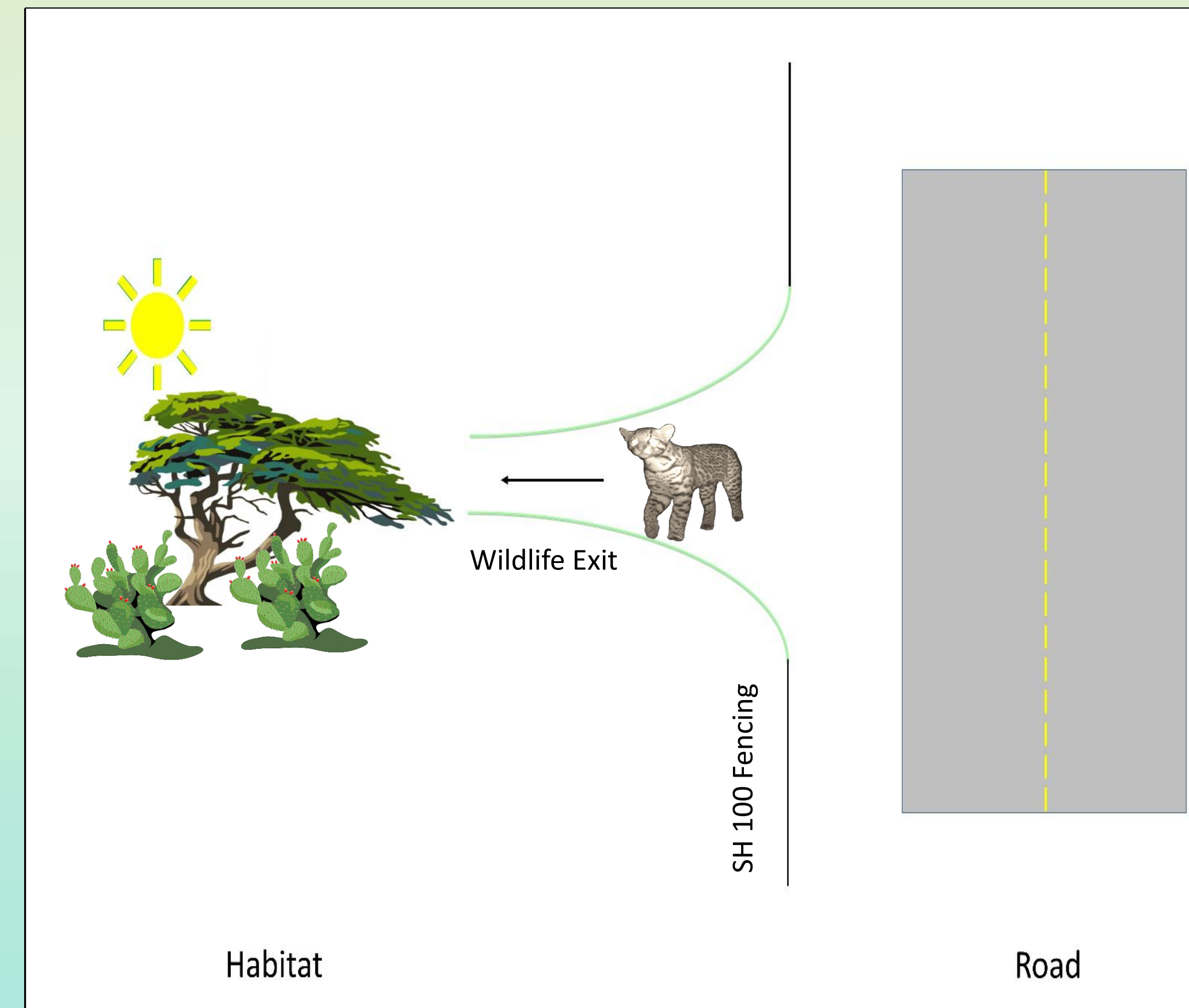
OBJECTIVE 1: Characterize the animal community using the wildlife exits, as well as how those species interact with them.

OBJECTIVE 2: Compare wildlife road mortalities pre- and post-installation of wildlife exits.



Wildlife Exits

- Material: 2" x 3" mesh 16-gauge black PVC coated welded wire
- Supported by six T-posts
- Wedge-shaped; height: 24", width: 18" at opening, narrowing to five inches
- Exit extends 33" into habitat



Methods

- Animal use of wildlife exits was determined using camera traps placed on each side of the exit.
 - Feb 2019 – Oct 2020
- Exit interactions quantified by species occurrence (habitat or road) and direction of travel.
- Weekly road mortality surveys conducted.
 - Pre-installation data: May 2018 – Feb 2019
 - Post-installation data: May 2019 – Feb 2020
- Total number of mortalities occurring within the range of all ten exits was determined for both periods using ArcGIS.
- A t-test was used to compare monthly pre- and post-installation mortalities.



Table 1. Species interactions from Feb 2019 – Oct 2020, as well as pre- and post-installation road mortalities are shown across exits. Habitat (H) and Road (R) columns indicate animals traveling parallel to the exit without attempting to enter it.

Species	Exit Interaction				Mortalities	
	Habitat to road	Road to habitat	Habitat (H)	Road (R)	Pre-installation	Post-installation
Black-tailed Jackrabbit	23	23	23	4	2	0
Bobcat	13	29	69	23	0	0
Coyote	5	14	202	16	0	2
Domestic Cat	3	13	46	21	0	1
Eastern Cottontail	1226	1147	1203	644	4	6
Long-tailed Weasel	4	5	36	13	0	0
Nine-banded Armadillo	1	2	1020	14	2	0
Northern Bobwhite	66	88	91	79	0	1
Northern Raccoon	6	43	147	55	2	4
Striped Skunk	2	6	27	2	1	3
Texas Tortoise	0	0	7	1	1	0
Virginia Opossum	113	236	965	300	6	6
Other	0	1	350	54	4	3
Total	1462	1607	4186	1226	22	26

Results

- Bobcats, used as a surrogate species for the ocelot, have been documented using the exit in their intended direction.
- Virginia opossums and eastern cottontails were observed using the exits the most and were also the species with the highest mortalities.
- No significant differences were detected in average mortalities occurring before and after the installation of the wildlife exits ($t_{df=74} = -0.699, p = 0.49$).

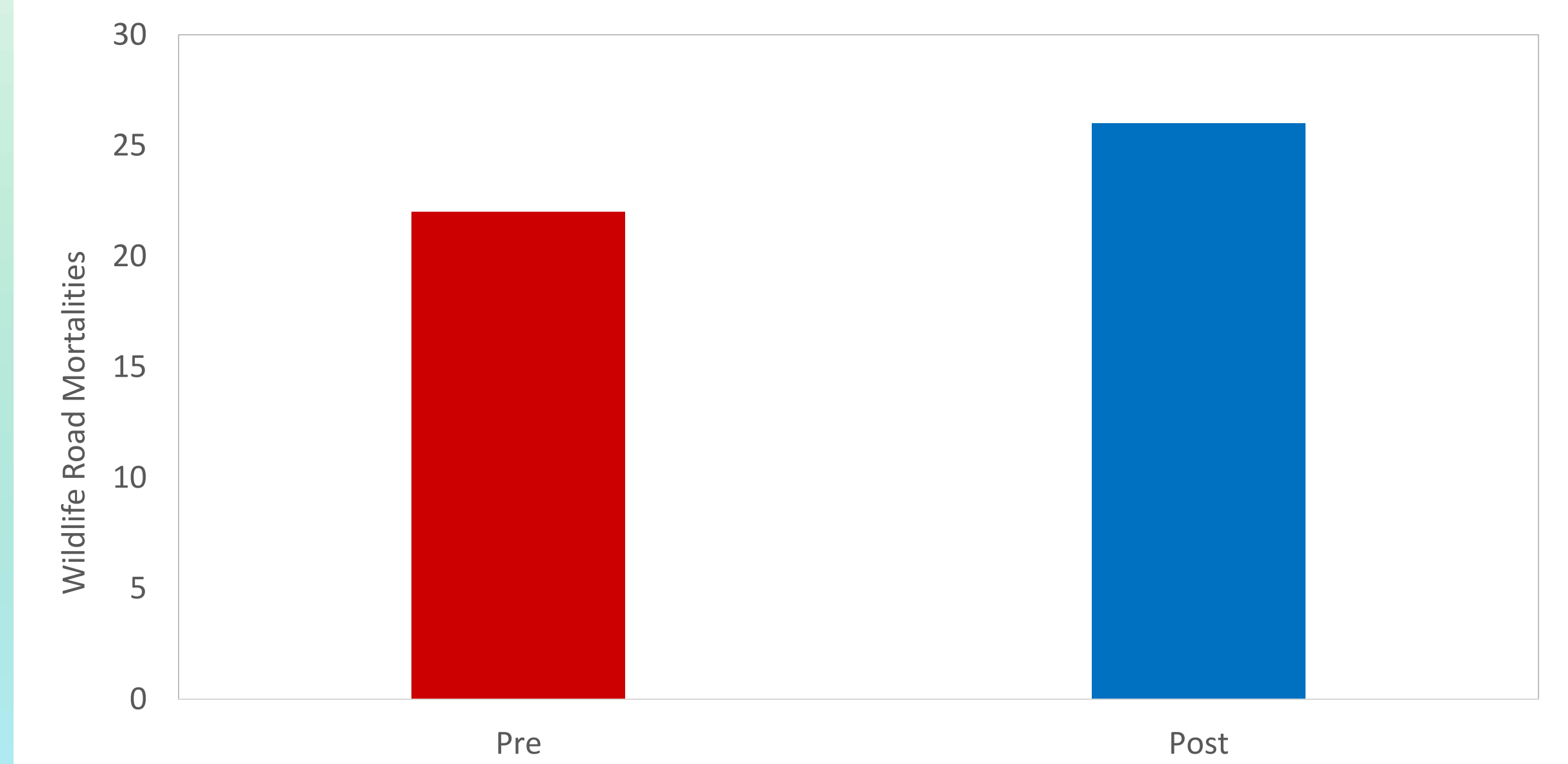


Figure 2. All mortalities occurring within the range of all ten wildlife exits along SH 100 before and after installation.

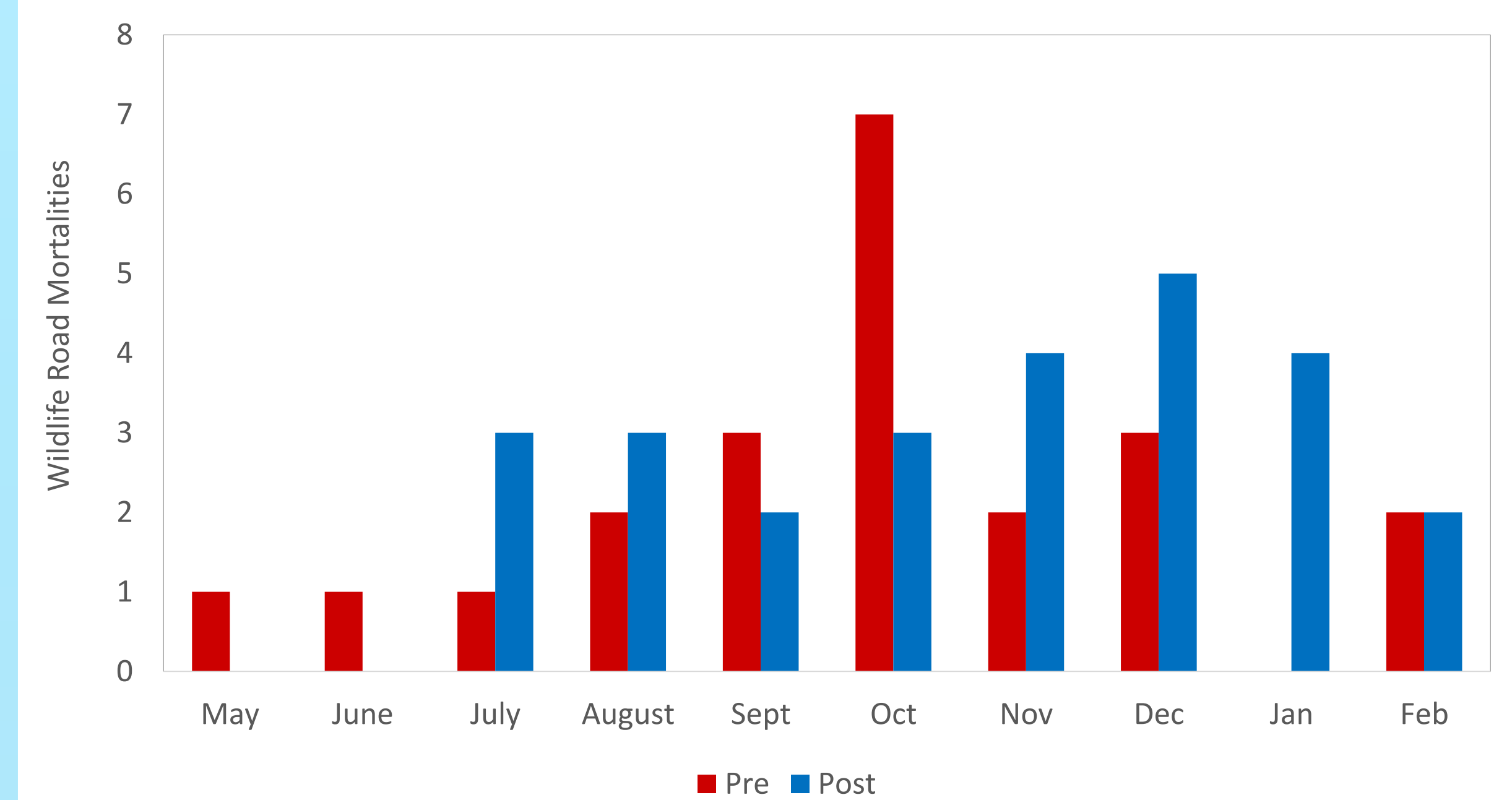


Figure 3. Monthly road mortalities across all ten wildlife exits along SH 100 before and after installation.

Discussion and Future Research

- Wildlife exits appear to be functioning as expected for mesopredators.
- Exits may decrease mortalities as animals learn their locations.
- Characterization of species use at each exit will continue.
- Future analyses will incorporate mitigation structure type and proximity in relation to exit use.
- This is part of a long-term monitoring project that will continue into 2023.
- Information gathered from these exits will be helpful in determining future placement.

References

- Grilo, C., J. Bissonette, M. J. B. Santos-Reis, and C. V. 17. 2008. Response of carnivores to existing highway culverts and underpasses: implications for road planning and mitigation. 1685-1699.
- Final Bi-annual Summary Report August 2018. (2018). The University of Texas Rio Grande Valley. Contract No 57-7XXIA003.
- Huijser et al. 2016. US 93 North Post-Construction Wildlife-Vehicle Crossing Monitoring on the Flathead Indian Reservation Between Evaro and Polson, Montana. Montana Department of Transportation.

Acknowledgments

Thomas Yamashita, T. Miles Hopkins, Anna Rivera Roy, and Victoria Rodriguez

